EXHIBIT A

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent of:	Doshi et al.	
U.S. Patent No.:	7,406,074	Attorney Docket No.: 35548-0135IP1
Issue Date:	July 29, 2008	
Appl. Serial No.:	10/193,932	
Filing Date:	July 12, 2002	
Title:	BUNDLING MESSAGES IN COMMUNICATION NETWORKS	

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PETITION FOR *INTER PARTES* REVIEW OF UNITED STATES PATENT NO. 7,406,074 PURSUANT TO 35 U.S.C. §§ 311–319, 37 C.F.R. § 42

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EX1004	Berger, et. al, "RSVP Refresh Overhead Reduction Extensions," RFC: 2961 (The Internet Society, Internet Engineering Task Force – Network Working Group) (April 2001) ("Berger")
EX1005	Lang, et. al, "Extensions to RSVP for optical networking," Internet Draft (Internet Engineering Task Force – Network Working Group) (March 2000) ("Lang")
EX1006	Awduche, et. al, "Extensions to RSVP for LSP Tunnels," Internet Draft (Internet Engineering Task Force – MPLS Working Group) (September 1999) ("Awduche")
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EX1009	Chandhok, et. al, "IP over Optical Networks: A Summary of Issues" Internet Draft (Internet Engineering Task Force – IPO and MPLS Working Groups) (March 2001) ("Chandhok")
EX1010	Declaration of Sandy Ginoza regarding public availability of EX1004 and EX1008.
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EX1012 Clark, et. al, "Supporting Real-Time Applications in an Integrated Services Packet Network: Architecture and Mechanism" Vol. 0-89791-526-7/92/0008/0014 ACM, p. 14 (1992)

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EX1100 Complaints filed in *WSOU Investments LLC v. Huawei Technologies Co., Ltd., et al*., Case Nos. 6:20-cv-00889, 6:20-cv-00891-00893, and 6:20-cv-00916-00917 (W.D. Tx.)

EX1101 Scheduling Order (Document 29), *WSOU Investments LLC v. Huawei Technologies Co., Ltd., et al*., Case Nos. 6:20-cv-00889, 6:20-cv-00891-00893, 6:20-cv-00916-00917 (W.D. Tx.)

EX1102 Huawei's Stipulation served in *WSOU Investments LLC v. Huawei Technologies Co., Ltd., et al*., Case No. 6:20-cv-00916-ADA (W.D. Tx.)

LIST OF CHALLENGED CLAIMS

Claim Element	Claim Language
[1.P]	A method for generating and transmitting messages in a communication network, comprising the steps of:
[1.1]	(a) combining, at a first component of the communication network, a plurality of messages into a bundled message, wherein:
[1.2]	the plurality of messages comprises one of (i) at least two connection requests, (ii) at least one connection request and at least one failure notification, and (iii) at least two failure notifications;
[1.3a]	when the bundled message comprises a plurality of connection requests, each of the connection requests corresponds to a request to configure a first switch node of the communication network for a different connection; and
[1.3b]	when the bundled message comprises a plurality of failure notifications, each of the failure notifications corresponds to failure of a different connection in the communication network; and
[1.4]	(b) transmitting the bundled message to a second component of the communication network, wherein:
[1.5]	the second component recovers the plurality of messages from the bundled message;
[1.6a]	when the bundled message comprises a plurality of connection requests, the second component implements the plurality of connection requests to configure the first switch node for a plurality of connections;
[1.6b]	when the bundled message comprises a plurality of failure notifications, the second component initiates restoration processing for a plurality of connections; and

Claim Element	Claim Language
[1.7]	each of the first and second components is part of a switch node in the communication network.
[2]	The invention of claim 1, wherein the bundled message comprises a plurality of failure notifications.
[3]	The invention of claim 1, wherein the bundled message comprises one or more connection set-up requests.
[4]	The invention of claim 3, wherein the bundled message further comprises at least one connection tear-down request.
[5]	The invention of claim 1, wherein: the second component is part of the first switch node; and the first component is part of another switch node in the communication network.
[6]	The invention of claim 5, wherein the plurality of messages correspond to a single source-destination pair.
[7]	The invention of claim 1, wherein the bundled message comprises a plurality of connection requests that are part of restoration processing in the communication network.
[13]	The invention of claim 1, wherein step (a) comprises, at the first component, the steps of: (a 1) receiving, from another switch node of the communication network, a first bundled message comprising a first set of messages; and (a2) generating a second bundled message comprising a subset of the first set of messages as well as one or more other messages received from one or more other switch nodes of the communication network, wherein the second bundled message is transmitted to the second component.

Claim Element	Claim Language
[14.P]	A method for receiving and processing messages in a communication network, comprising the steps of:
[14.1]	(a) receiving a bundled message at a second component of the communication network, wherein:
[14.2]	the bundled message was generated at a first component of the communication network and transmitted from the first component to the second component;
[14.3]	the bundled message comprises a plurality of messages;
[14.4]	the plurality of messages comprises one of (i) at least two connection requests, (ii) at least one connection request and at least one failure notification, and (iii) at least two failure notifications;
[14.5a]	when the bundled message comprises a plurality of connection requests, each of the connection requests corresponds to a request to configure a first switch node of the communication network for a different connection;
[14.5b]	when the bundled message comprises a plurality of failure notifications, each of the failure notifications corresponds to failure of a different connection in the communication network; and
[14.6]	each of the first and second components is part of a switch node in the communication network;
[14.7]	(b) recovering, at the second component, the plurality of messages from the bundled message;
[14.8a]	(c) when the bundled message comprises a plurality of connection requests, implementing the plurality of connection requests to configure the first switch node for a plurality of connections; and

Claim Element	Claim Language
[14.8b]	(d) when the bundled message comprises a plurality of failure notifications, initiating restoration processing for a plurality of connections.
[15]	The invention of claim 14, wherein the bundled message comprises a plurality of failure notifications.
[16]	The invention of claim 14, wherein the bundled message comprises one or more connection set-up requests.
[17]	The invention of claim 16, wherein the bundled message further comprises at least one connection tear-down request.
[18]	The invention of claim 14, wherein: the second component is part of the first switch node; and the first component is part of another switch node in the communication network.
[19]	The invention of claim 18, wherein the plurality [of] messages correspond to a single source-destination pair.
[20]	The invention of claim 14, wherein the bundled message comprises a plurality of connection requests that are part of restoration processing in the communication network.
[26.P]	A method for generating and transmitting messages in a communication network, comprising the steps of:
[26.1]	(a) combining, at a first component of the communication network, a plurality of messages into a bundled message, wherein:
[26.2]	the plurality of messages comprises one of (i) at least two connection requests, (ii) at least one connection request and at least one failure notification, and (iii) at least two failure notifications;
[26.3a]	when the bundled message comprises a plurality of connection requests, each of the connection requests corresponds to a

Claim Element	Claim Language
	request to configure a first switch node of the communication network for a different connection; and
[26.3a]	when the bundled message comprises a plurality of failure notifications, each of the failure notifications corresponds to failure of a different connection in the communication network; and
[26.4]	(b) transmitting the bundled message to a second component of the communication network, wherein:
[26.5]	the second component recovers the plurality of messages from the bundled message;
[26.6a]	when the bundled message comprises a plurality of connection requests, the second component implements the plurality of connection requests to configure the first switch node for a plurality of connections;
[26.6b]	when the bundled message comprises a plurality of failure notifications, the second component initiates restoration processing for a plurality of connections; and
[26.7]	the bundled message comprises at least one of a failure notification, a connection set-up request, and a connection tear-down request.
[27.P]	A method for receiving and processing messages in a communication network, comprising the steps of:
[27.1]	(a) receiving a bundled message at a second component of the communication network, wherein:
[27.2]	the bundled message was generated at a first component of the communication network and transmitted from the first component to the second component;
[27.3]	the bundled message comprises a plurality of messages;

Claim Element	Claim Language
[27.4]	the plurality of messages comprises one of (i) at least two connection requests, (ii) at least one connection request and at least one failure notification, and (iii) at least two failure notifications;
[27.5a]	when the bundled message comprises a plurality of connection requests, each of the connection requests corresponds to a request to configure a first switch node of the communication network for a different connection;
[27.5b]	when the bundled message comprises a plurality of failure notifications, each of the failure notifications corresponds to failure of a different connection in the communication network; and
[27.6]	the bundled message comprises at least one of a failure notification, a connection set-up request, and a connection tear-down request;
[27.7]	(b) recovering, at the second component, the plurality of messages from the bundled message;
[27.8a]	(c) when the bundled message comprises a plurality of connection requests, implementing the plurality of connection requests to configure the first switch node for a plurality of connections; and
[27.8b]	(d) when the bundled message comprises a plurality of failure notifications, initiating restoration processing for a plurality of connections.
[28.P]	A method for generating and transmitting messages in a communication network, comprising the steps of:
[28.1]	(a) combining, at a first component of the communication network, a plurality of messages into a bundled message, wherein:
[28.2]	the plurality of messages comprises one of (i) at least two connection requests, (ii) at least one connection request and at

Claim Element	Claim Language
	least one failure notification, and (iii) at least two failure notifications;
[28.3a]	when the bundled message comprises a plurality of connection requests, each of the connection requests corresponds to a request to configure a first switch node of the communication network for a different connection; and
[28.3b]	when the bundled message comprises a plurality of failure notifications, each of the failure notifications corresponds to failure of a different connection in the communication network; and
[28.4]	(b) transmitting the bundled message to a second component of the communication network, wherein:
[28.5]	the second component recovers the plurality of messages from the bundled message;
[28.6a]	when the bundled message comprises a plurality of connection requests, the second component implements the plurality of connection requests to configure the first switch node for a plurality of connections;
[28.6b]	when the bundled message comprises a plurality of failure notifications, the second component initiates restoration processing for a plurality of connections; and
[28.7]	the bundled message comprises a plurality of connection requests that are part of restoration processing in the communication network.
[29.P]	A method for receiving and processing messages in a communication network, comprising the steps of:
[29.1]	(a) receiving a bundled message at a second component of the communication network, wherein:

Claim Element	Claim Language
[29.2]	the bundled message was generated at a first component of the communication network and transmitted from the first component to the second component;
[29.3]	the bundled message comprises a plurality of messages;
[29.4]	the plurality of messages comprises one of (i) at least two connection requests, (ii) at least one connection request and at least one failure notification, and (iii) at least two failure notifications;
[29.5a]	when the bundled message comprises a plurality of connection requests, each of the connection requests corresponds to a request to configure a first switch node of the communication network for a different connection;
[29.5b]	when the bundled message comprises a plurality of failure notifications, each of the failure notifications corresponds to failure of a different connection in the communication network; and
[29.6]	the bundled message comprises a plurality of connection requests that are part of restoration processing in the communication network;
[29.7]	(b) recovering, at the second component, the plurality of messages from the bundled message;
[29.8a]	(c) when the bundled message comprises a plurality of connection requests, implementing the plurality of connection requests to configure the first switch node for a plurality of connections; and
[29.8b]	(d) when the bundled message comprises a plurality of failure notifications, initiating restoration processing for a plurality of connections.

Huawei Technologies Co., Ltd. ("Huawei" or "Petitioner") petitions for *Inter Partes* Review ("IPR") of claims 1-7, 13-20, and 26-29 ("the challenged claims") of U.S. Patent No. 7,406,074 ("the '074 patent").

I. MANDATORY NOTICES UNDER 37 C.F.R § 42.8(a)(1)

A. Real Party-In-Interest Under 37 C.F.R. § 42.8(b)(1)

Huawei Technologies Co., Ltd.; Huawei Device USA, Inc.; Huawei Technologies USA Inc.; Huawei Investment & Holding Co., Ltd.; Huawei Device (Shenzhen) Co., Ltd.; Huawei Device Co., Ltd.; Huawei Tech. Investment Co., Ltd.; and Huawei Device (Hong Kong) Co., Ltd. are the real parties-in-interest. No other parties had access to or control over this Petition, and no other parties funded this Petition.

B. Related Matters Under 37 C.F.R. § 42.8(b)(2)

WSOU Investments, LLC d/b/a Brazos Licensing and Development ("WSOU")—the alleged Patent Owner—filed a complaint against Huawei Technologies Co., Ltd. and Huawei Technologies USA Inc. asserting the '074 patent on September 29, 2020 in the U.S. District Court for the Western District of Texas (Case No. 6:20-cv-00892). The complaint was one of six patent lawsuits filed by WSOU against Huawei between September 29, 2020 and October 2, 2020:

Asserted Patent No.	Civil Case No. (W.D. Tex.)
6,704,304	6-20-cv-00889
7,406,260	6-20-cv-00891
7,460,658	6-20-cv-00892

7,933,211	6-20-cv-00893
7,406,074	6-20-cv-00916
7,423,962	6-20-cv-00917

None of the six asserted patents is related to another.

Petitioner is not aware of any disclaimers or reexamination certificates addressing the '074 patent.

C. Lead And Back-Up Counsel Under 37 C.F.R. § 42.8(b)(3)

Petitioner provides the following designation of counsel.

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D. Service Information

Please address all correspondence and service to the address listed above.

Huawei consents to electronic service by email at IPR35548-0135IP1@fr.com (referencing No. 35548-0135IP1 and cc'ing PTABInbound@fr.com, hawkins@fr.com, and bisenius@fr.com).

II. PAYMENT OF FEES

Huawei authorizes the Office to charge Deposit Account No. 06-1050 for the fee set in 37 C.F.R. § 42.15(a) and further authorizes payment for any additional fees to be charged to this Deposit Account.

III. REQUIREMENTS FOR IPR

A. Grounds for Standing

Huawei certifies that the '074 patent is available for IPR and that Huawei is not estopped from requesting IPR.

B. Challenge and Relief Requested

Huawei requests IPR of claims 1-7, 13-20, and 26-29 of the '074 patent on the grounds listed below. A declaration from Dr. Robert McNamara (EX1003) supports this Petition.

Ground	Claims	Basis
1	**1-7, 14-20, 26-29**	§103–Berger + Lang + Awduche
2	**1-7, 14-20, 26-29**	§103–Berger + Lang + Awduche + Rosen
3	**13**	§103–Berger + Lang + Awduche + Baker
4	**13**	§103–Berger + Lang + Awduche + Rosen + Baker

The earliest possible priority date of the '074 patent is its filing date of July 12, 2002. Berger (published April 2001), Lang (published March 2000), Awduche (published September 1999), and Rosen (published February 1999) are prior art under at least §102(b) as printed publications published over a year prior to July 12, 2002. EX1010, ¶¶1-12; EX1011, ¶¶1-12. For example, the evidence here confirms that Berger was an IETF publication that was known to interested members of the public and publicly accessible no later than April 2001. EX1010, ¶¶11, 6-10. Likewise, the evidence here also confirms that Lang was another IETF publication available to skilled artisans and publicly accessible no later than March 2000. EX1011, ¶¶9, 4-8. Similarly, for Awduche, Rosen, and Chandhok (EX1009, which is cited to corroborate Dr. McNamara's testimony regarding the background knowledge of a POSITA), the evidence here also confirms that these IETF publications were publicly accessible no later than September 1999, February 1999, and March 2001, respectively. EX1011, ¶¶10-12, 4-8.

Baker (published September 2001) is prior art under at least §102(a) as a printed publication published prior to July 12, 2002. The evidence here confirms that Baker was another IETF publication known to interested members of the public and publicly accessible no later than September of 2001. EX1010, ¶¶12, 6-10.

IV. SUMMARY OF THE '074 PATENT

A. Brief Description

Generally, the '074 patent is directed toward bundling together multiple requests to "set up and/or tear down connections" within a communications network or multiple failure notifications. EX1001, Abstract; EX1003, ¶¶23-25. For example, "multiple connection requests/failure notifications are bundled together as a single message for transmission between pairs of nodes in the network." *Id.* In one example, "two or more connection requests are bundled together into a single message for transmission from one node to another in a communication network. In that case, the receiving node needs to decode only a single message to recover and then implement the two or more connection requests." EX1001, 2:26-34. As another example, when a network failure is detected a node "bundles two or more failure notifications together into a single message for transmission to a node upstream of the failure." *Id.*, 2:37-41. In some cases "each failure notification in the message corresponds to a different communication channel between the two nodes." EX1001, 4:14-22.

However, as demonstrated by the prior art combinations described herein, bundling of connection request and failure notification messages for transmission between nodes was known in similar prior art communications systems.

B. Prosecution History

The application resulting in the '074 patent was filed on July 12, 2002 with

25 claims. EX1002, 105-106, 120-123. After the independent claims were rejected based on US Pub. 2003/0018822 ("Robb"), the applicant amended independent claims 1 and 14 to recite "each of the first and second components is part of a switch node in the communication network" and added new independent claims 26-29. EX1002, 85-90, 75-83. Claims 1 and 14 were then rejected under § 112 as indefinite for reciting "each of the first and second components is part of a switch node in the communication network" as it was unclear if this recitation required the first and second components to be part of the same switch node. *Id.*, 60-61. Applicant responded by asserting that this claim language "is purposefully general to cover two different situations" including "a first situation in which the first and second components are part of a single switch node" and "a second situation in which the first and second components are part of two different switch nodes." *Id.*, 55-56. The application was subsequently allowed because it was believed that the prior art failed to provide "transmitting/receiving a bundled message comprising a plurality of messages wherein the plurality of messages comprising one of at least two connection request[s], at least one connection request and at least one failure notification and at least two failure notifications." *Id.*, 11-16.

However, as demonstrated below, bundling of messages containing a plurality of connection requests, failure notifications, or both for transmission between switching nodes in a communications system was known in the prior art.

The ’074 patent would not have issued if this more pertinent prior art—as cited in Grounds 1-4 here—was fully considered by the Examiner at the time.

V. LEVEL OF ORDINARY SKILL

The testimony evidence here confirms that a person of ordinary skill in the art at the time of the ’074 patent (a “POSITA”) would have had at least a Master’s degree in computer science, electrical engineering, computer engineering, or a related field, with 2-3 years of experience in communications networks. EX1003, ¶18.

VI. CLAIM CONSTRUCTION

All claim terms should be construed according to the *Phillips* standard. *See* 37 C.F.R. § 42.100. Given the noticeable similarity between the predictable combination in Grounds 1-2 (below) and the preferred embodiment of the ’074 patent, no formal construction is necessary in this proceeding. *Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011).

While no formal constructions are necessary, Petitioner notes that certain claim elements and claim element pairs are presented in the alternative such that the prior art combinations described herein need only provide one of recited alternatives to render obvious the claims containing such alternative claim elements.

As a first example, element [1.2] recites “the plurality of messages

comprises one of…" followed by three alternatives. As such, the prior art combinations need provide only one of the listed alternatives to achieve the requirements of claim 1. Elements [14.4], [26.2], [27.4], [28.2], and [29.4] are identical to element [1.2] and should therefore be treated the same. EX1003, ¶¶32.

Elements [1.3a] and [1.3b] recite alternative conditions (and also Elements [1.6a] and [1.6b]). In particular, the first alternative condition recites limitations that only apply "when the bundled message comprises a plurality of connection requests," and the second alternative condition recite limitations that only apply "when the bundled message comprises a plurality of failure notifications." Therefore, the prior art combinations need only provide one of the alternative condition pairs [1.3a]/[1.3b] and one of alternative condition pairs [1.6a]/[1.6b] to achieve the requirements of claim 1. Claims 14, 26, 27, 28, and 29 include recitations that are identical or nearly identical to alternative element pairs [1.3a]/[1.3b] and [1.6a]/[1.6b] and should therefore be treated the same. EX1003, ¶¶33-34.

VII. DETAILED EXPLANATION OF GROUNDS

A. GROUND 1: The Berger-Lang-Awduche combination renders obvious claims 1-7, 14-20, 26-29

1. Overview of Berger

Berger is a specification titled "RSVP Refresh Overhead Reduction Extensions" that describes various improvements to the "RSVP (Resource

ReserVation Protocol)" network communications protocol to "reduce processing overhead requirements." EX1004, 1; EX1003, ¶¶35-38. These improvements include a "Bundle message…to reduce overall message handling load." EX1004, 3. Berger describes that "[a]n ***RSVP Bundle message*** consists of a bundle header followed by a body consisting of ***a variable number of standard RSVP messages***. A Bundle message is used to aggregate multiple RSVP messages."[1] *Id.*, 5. Each "sub-message" included in a Bundle message "MAY be ***any message type*** except for another Bundle message." *Id.*, 6. This includes "Path and PathTear messages." EX1004, 8. When a destination node receives a Bundle message "[t]he receiver then starts decapsulating individual sub-messages" such that "each sub-message is processed as if it was received individually." *Id.*

2. Overview of Lang

Lang is an "Internet Draft" titled "Extensions to RSVP for optical networking" that, like Berger, describes improvements to the RSVP network communications protocol, including functionality "to establish, teardown, and reroute optical trails through the network." EX1005, 1. Lang describes a failure notification "so that an RSVP node can notify (possibly non-adjacent) RSVP nodes when network failures occur, without affecting the RSVP states of intermediate

[1] All emphasis added unless otherwise noted.

RSVP nodes" and "a modification to allow bundle messages to be sent to non-adjacent RSVP nodes." *Id.*; EX1003, ¶¶39-41. Lang describes that the nodes in such a network include "label switched routers (LSRs) and optical crossconnects (OXCs) that internetwork using the MPL(ambda)S control plane" having "internal switching fabric." EX1005, 2.

Lang's failure notifications allow the network to quickly react to network failures and make rerouting decisions through "the ability to rapidly detect and isolate failures as well as to notify the nodes responsible for restoring the failed optical trails." EX1005, 6. "As part of failure notification, a node passing transit trails (i.e., trails that neither originate nor terminate at that node) should be able to notify the nodes responsible for restoring the trails when failures occur (e.g., the source node needs to be notified if end-to-end path restoration is used)." *Id.*, 6-7.

To facilitate easier notification of the nodes responsible for restoring trials when failures occur, and the "rerouting [of] multiple optical paths simultaneously," Lang proposes implementing bundle messages "to include ***the entire set of Notify messages in a single bundle message*** and send it to the responsible RSVP node directly, without message processing by the intermediate RSVP nodes." EX1005, 7-8. This "enable[s] fast protection/restoration techniques" by allowing an RSVP node "to send multiple simultaneous messages to a nonadjacent RSVP node" bundled together in a single bundle message when the notifying RSVP node

"detects a failure affecting multiple trails with [the notification recipient] node as the source." *Id.*, 8, 1 ("a modification to allow bundle messages to be sent to non-adjacent RSVP nodes").

3. Overview of Awduche

As with Berger and Lang, Awduche "describes the use of RSVP, including all the necessary extensions, to establish label-switched paths (LSPs) in MPLS." EX1006, 1-4 ("This document is a specification of extensions to RSVP ***for establishing label switched paths (LSPs)*** in Multi-protocol Label Switching (MPLS) networks"); EX1003, ¶¶42-45. Awduche, also refers to "paths" as "tunnels." E1006, 1-4 ("these paths can be treated as tunnels"); EX1003, ¶42. Awduche describes that "LSP tunnels can be automatically or manually ***routed away from network failures***, congestion, and bottlenecks. Furthermore, ***multiple parallel LSP tunnels can be established between two nodes***." EX1006, 4. This routing, including "rout[ing] away from network failures," is conducted using a specific RSVP "Path message." EX1006, 8, 20-21. As described by Awduche, RSVP "supports explicit routing capability" using an "EXPLICIT_ROUTE object" ("ERO") included in the RSVP Path message to define "the explicitly routed path." *Id.*, 5-6. Identification of explicit paths "enables the allocation of resources along the path." *Id.*, 6-8.

To create a path "the first MPLS node on the path…creates an RSVP Path message" which can include an ERO when the sender node determines "to use the route for some or all of its sessions." EX1006, 7, 19 ("To establish an LSP tunnel the sender creates a Path message with a LABEL_REQUEST object"). "Path messages from different senders can each carry their own ERO, and the paths taken by the senders can converge and diverge at any point in the network topology." *Id.*, 10-11, 20.

Awduche further describes rerouting paths "upon failure of a resource along the tunnel's established path" and "return[ing] LSP tunnel to its original path when the failed resource becomes re-activated." EX1006, 11. To reroute a path in response to a detected failure, "the node sends a new Path Message using the original SESSION object and the new SENDER_TEMPLATE and ERO." *Id.*, 12.

4. The Predictable Berger-Lang-Awduche Combination

A POSITA would have recognized that it would have been predictable and beneficial to apply the teachings of Lang and Awduche to Berger to provide additional functionality to the RSVP network communication protocol described by all three references. At a high level, a POSITA would have recognized that it would have been beneficial to implement RSVP, as described by Berger, to further include the failure notifications described by Lang "so that an RSVP node can notify (possibly non-adjacent) RSVP nodes when network failures occur," to

include failure notifications in bundle messages, and to "allow bundle messages to be sent to non-adjacent RSVP nodes." EX1005, 1-2, 6-8; EX1003, ¶¶54-55.

Multiple reasons would have prompted a POSITA to Modify the RSVP communications protocol described by Berger to further include failure notifications and to allow bundle messages (including those containing failure notifications) to be communicated to non-adjacent RSVP nodes. EX1003, ¶¶55-60, 67. A POSITA would have been prompted to modify Berger based on Lang to achieve the benefits of "***small setup latency, support for bi-directional trails, and rapid restoration of trails in case of network failures***." EX1005, 2; EX1003, ¶¶56-58. A POSITA would have recognized that all three of these known benefits would have improved communications systems employing RSVP, as described by Berger. EX1003, ¶¶56-58.

Turning to this first benefit ("small setup latency"), Lang describes that the proposed modifications lead to "***[r]eduction of trail establishment latency*** by allowing resources to be configured in the downstream direction" in addition to the upstream direction. EX1005, 2; EX1003, ¶56.

The second benefit described by Lang allows for "[e]stablishment of bi-directional trails as a single process instead of establishing two uni-directional trails" thereby reducing path setup overhead. EX1005, 2-3; EX1003, ¶57.

The third benefit is that Lang's failure notifications, and the inclusion of

multiple failure notifications in a bundle message, facilitate "***[f]ast failure notification*** to a node responsible for trail restoration can be achieved so that ***restoration techniques can be quickly initiated***." EX1005, 3. This minimizes communication downtime in the event of a failure, leading to avoidance of interruptions in real-time communications. EX1003, ¶58. As Lang describes, and would have been known to a POSITA, "[a] requirement of reliable optical networks is that reaction to network failures must be quick, and rerouting decisions must be made intelligently." EX1005, 6; EX1003, ¶58. Lang's suggestion for a new failure notification (and to include multiple bundle notifications in a bundle message) provides "***the ability to rapidly detect and isolate failures*** as well as to ***notify the nodes responsible for restoring the failed optical trails***." EX1005, 6-7. Including the failure notifications in bundle messages increases this benefit by providing "high reliability" and "fast protection and restoration techniques" when responding to a failure "require[s] rerouting multiple optical paths simultaneously." *Id.*, 7-8; EX1003, ¶58. This quick restoration of multiple optical paths is facilitated by "send[ing] multiple simultaneous [failure notification] messages to a nonadjacent RSVP node" in a bundle message." *Id.*

As a fourth benefit, Lang's suggestion to transmit failure notifications and bundle messages to non-adjacent nodes allows the system "to notify the nodes responsible for restoring the trails when failures occur…***without intermediate***

nodes processing the messages or modifying the state of the affected trails."

EX1005, 6-7; EX1003, ¶59. "This is important because restoration procedures may reuse segments of the original trail in a 'make-before-break' fashion." *Id.*

As a fifth benefit, Lang describes that including failure notifications in bundle messages will "reduce the overall message-handling load." EX1005, 7; EX1003, ¶60. Bundling failure notifications allows "nodes that are running restoration algorithms [to] consider as many failed trails as possible before making restoration decisions." EX1005, 8. Lang expressly describes that "[t]o ***improve performance*** and ensure that the ***nodes are provided with as many of the affected paths as possible***, ***it is useful to include the entire set of Notify messages in a single bundle message*** and send it to the responsible RSVP node directly, without message processing by the intermediate RSVP notes." *Id.*

Additionally, a number of reasons would have prompted a POSITA to further apply Awduche's teachings to the Berger-Lang combination to provide additional functionality of utilizing RSVP Path messages to establish communications "paths" or "tunnels" between switching nodes and a PathTear message for tearing down old routes. EX1006, 5, 7, 12-13, 38, 46. As a first reason, a POSITA would have recognized that use of the "RSVP Path message" to establish communications paths between nodes in an RSVP network would have allowed data to be communicated between source and destination nodes using such

paths, which is the primary purpose of a communications network. EX1006, 5, 7-8, 10-11, 12-13; EX1003, ¶61. A POSITA would have recognized that establishing communications paths between nodes allows for data traffic to be exchanged between the nodes and therefore the Path message facilitates data communication, which is the entire point of a communications network. EX1003, ¶61.

Second, a POSITA would have recognized that the RSVP Path message described by Awduche would have provided "the capability to dynamically reroute an established LSP tunnel" in the event of a failure in an original route/path. EX1006, 7; EX1003, ¶62. As Awduche describes, and as would have been known to a POSITA, "[o]ne of the requirements for Traffic Engineering is the capability to reroute an established LSP tunnel under a number of conditions." EX1006, 11-12; EX1003, ¶62; *see also* EX1005 6-8 (describing the importance of "quick" rerouting of "multiple optical paths simultaneously"). The RSVP Path message described by Awduche would have beneficially facilitated such rerouting. EX1006, 12-13 ("To effect a reroute…***the node sends a new Path Message***.")

Third, a POSITA would have recognized that the RSVP Path message described by Awduche allows for greater control over establishing communications paths between nodes in a network using the previously described "EXPLICIT_ROUTE object" ("ERO") to define "the explicitly routed path." *Id.*,

5-6, 8, 10-11; EX1003, ¶63. Identification of explicit paths "enables the allocation of resources along the path." *Id.*, 6-8.

Fourth, implementing Awduche's PathTear message allows the system to tear down an old path when rerouting. EX1006, 38 ("When the ingress node receives the Resv Message(s), it may begin using the new route. It SHOULD send a PathTear message for the old route."), 11-12, 46; EX1003, ¶64.

Fifth, Berger expressly describes that RSVP "includes Path and PathTear messages" and therefore, when implementing an RSVP communications system based on the teachings of Berger, a POSITA would have turned to other documents describing the functionality of such Path and PathTear messages to provide the benefit of properly executing Path and PathTear messages to establish and tear down paths, respectively. EX1004, 8, 3, 13-15, 28; EX1003, ¶65. Awduche provides just such a teaching on the use of Path and PathTear messages, including the required format for a "Path Message" (EX1006, 13) thereby beneficially facilitating Path creation and teardown in the RSVP system of Berger. EX1003, ¶65.

Sixth, Lou Berger (first named author of "Berger") was also an author of Awduche. EX1004, 1; EX1006, 1. A POSITA reviewing Berger would have naturally looked to other publications by the same authors of Berger to identify additional implementation details when designing an RSVP network and therefore

would have been compelled to look to Awduche. EX1003, ¶66. Similarly, Lang cites to Awduche (and an earlier version of Berger) as documents describing the methods on which Lang's improvements are built, and therefore a POSITA would have been compelled to look to Awduche to identify such additional development details. EX1005, 9, 7-8; EX1003, ¶66.

Finally, a POSITA would have been prompted to implement the additional RSVP functionality described in Lang and Awduche in the RSVP communication system described by Berger because doing so would have been merely the application of a known technique (e.g., Lang's Failure Notification and non-adjacent node bundle messages and Awduche's Path and PathTear messages) to a known system (as described by Berger) ready for improvement to yield predictable results. EX1003, ¶67; *see KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 417 (2007). Here, all three of Berger, Lang, and Awduche describe aspects of the RSVP network communication protocol and a POSITA would have recognized that the suggestions of Lang and Awduche would have been readily and beneficially applied to Berger. EX1003, ¶67. A POSITA would have furthermore had a reasonable expectation of success in modifying the RSVP system described by Berger based on Lang and Awduche as they all are directed to related aspects of the same specific technology. EX1003, ¶¶67, 54-55. Berger states that it "present[s] no backwards compatibility issues" and therefore would have been

fully compatible with the earlier published Awduche and Lang RSVP documents. EX1004, 1. Indeed, Berger's authors specifically "request[] discussion and ***suggestions for improvements***" and Lang and Awduche provide just such suggested improvements to RSVP. EX1004, 1. In fact, Lang cites to both Awduche and an earlier version of Berger as being the foundation on which Lang's improvements are built. EX1005, 8-9.

5. Application of the Berger-Lang-Awduche combination to Claims 1-7

Preamble [1.P]

To the extent the preamble is treated as a limitation, the above-described Berger-Lang-Awduche combination provides a method for generating and transmitting messages in a communication network. EX1003, ¶¶68-69. For example, Berger's teachings "support reliable ***RSVP message delivery***." EX1004, 1, 3 ("…***generation, transmission***, reception and processing of ***RSVP Path*** and Resv ***messages***"), 27-31. Berger specifically allows at least some RSVP nodes in a communications network "to ***transmit*** every standard ***RSVP message*** in a Bundle message." *Id.*, 7. Such messages "[i]nclude at least: Path, Resv, PathTear, ResvTear, PathErr and ResvErr." *Id.*, 13, 8. The RSVP protocol described by Berger, Lang, and Awduche facilitates communications in "optical networks." EX1005, 1; EX1004, 29 (describing "RSVP nodes ***in a network***"); EX1006, 3-4 ("Multi-protocol Label Switching (MPLS) networks").

Element [1.1]

The Berger-Lang-Awduche combination provides element [1.1]. EX1003, ¶70. Berger describes a "Bundle message…to reduce overall message handling load." EX1004, 3. Berger describes implementations in which at least some RSVP nodes are configured "to transmit ***every standard RSVP message in a Bundle message***." *Id*., 7. Berger describes that "[a]n ***RSVP Bundle message*** consists of a bundle header followed by a body consisting of ***a variable number of standard RSVP messages***. A Bundle message is used to aggregate multiple RSVP messages." *Id.*, 5. Each "sub-message" included in a Bundle message "MAY be ***any message type*** except for another Bundle message." *Id.*, 6. This includes "Path and PathTear messages." EX1004, 8. Lang similarly describes including multiple failure notification messages "in a single bundle message." EX1005, 7-8.

Element [1.2]

The Berger-Lang-Awduche combination provides element [1.2]. EX1003, ¶¶71-75. Berger's "Bundle message is used to aggregate multiple RSVP messages" and can include "***any message type***." EX1004, 5-8. These message types include "Path and PathTear messages." EX1004, 8, 13-15. A POSITA would have recognized that a bundle message including multiple "Path messages" provides the claimed "at least two connection requests." EX1003, ¶73. As described by Awduche, an RSVP Path message is used to establish a "path" or "tunnel" and

therefore renders obvious a connection request. EX1006, 1-2, 5-8, 19 ("To establish an LSP tunnel the sender creates a Path message with a LABEL_REQUEST object"); *supra*, Section VII.A.3.

As discussed in Section VII.A.2, *supra*, Lang discloses "***Failure Notification[s]***…to notify the nodes responsible for restoring the failed optical trails" and including multiple failure notifications "in a single bundle message." EX1005, 6-8. Because a Bundle message can include any combination of messages (other than other Bundle messages), the predictable combination provides bundling any combination of connection requests ("Path messages") and failure notifications. EX1003, ¶¶74-75; EX1004, 5-8; EX1005, 6-8.

Element [1.3a]

The Berger-Lang-Awduche combination provides element [1.3a]. EX1003, ¶¶76-83. Berger discloses that Bundle messages include multiple sub messages of "any message type" and expressly discloses path messages as a standard RSVP message type. EX1004, 6-8 ("Any message that will be handled by the RSVP neighbor indicated in a Bundle Message's destination address may be ***included in the same message***…It also includes Path and PathTear messages."). Lang further discloses that the destination node can be a non-neighbor node. EX1005, 7-8, 1-2 ("we propose a modification to allow bundle messages to be sent to non-adjacent RSVP nodes."). Returning to Berger, "each sub-message *is* ***processed as if it was***

received individually." EX1004, 8, 12 ("As is always the case with the Bundle message, each sub-message is processed as if it was received individually."). Therefore for a Bundle message including multiple Path messages for different connections, each Path message will be "processed as if it was received individually" to configure the recipient node (the claimed "first switch node") for a different connection. EX1003, ¶77.

As described in Sections VII.A.3-4, Awduche provides additional details on how Path messages are used to establish connections between RSVP nodes in the predictable Berger-Lang-Awduche combination and therefore the Path messages in the predictable combination are connection set-up requests. EX1003, ¶¶78-79. This includes providing an express file format for the RSVP Path message that includes details on the sending node and express details about the route. EX1006, 13. As Awduche teaches "***[t]o create an LSP tunnel***, the first MPLS node on the path -- that is, the sender node with respect to the path -- ***creates an RSVP Path message*** with a session type of LSP_Tunnel_IPv4 and inserts a LABEL_REQUEST object into the Path message." EX1006, 7, 19 ("***To establish an LSP tunnel the sender creates a Path message*** with a LABEL_REQUEST object…When the Path message reaches the receiver, the presence of the LABEL_REQUEST object ***triggers the receiver to allocate a label*** and to place the label in the LABEL object for the corresponding Resv message."). This

"LABEL_REQUEST object requests intermediate routers and receiver nodes to provide a label binding for the session." *Id.*, 8. A POSITA would have recognized that allocation of a label "[t]o establish an LSP tunnel" by the receiving node in response to receiving a Path message renders obvious configuring the first switch node of the communication network for a connection. EX1003, ¶¶78-79. "Furthermore, ***multiple parallel LSP tunnels can be established between two nodes***." EX1006, 4. This teaching of establishing multiple parallel LSP tunnels (i.e., connections) between two nodes using Path messages paired with Berger's disclosure of Bundling Path messages and processing each message in a Bundle message "as if it was received individually" renders obvious "each of the connection requests corresponds to a request to configure a first switch node of the communication network for a different connection" as recited by element [1.3a]. EX1004, 6-8, 12; EX1003, ¶79.

Furthermore, the Berger-Lang-Awduche combination provides that the nodes (including the node receiving the bundled message) are switches. EX1003, ¶¶80-83. For example, Lang discloses implementing RSVP nodes as "optical crossconnects (OXCs)" having "***internal switching fabric***." EX1005, 1-2. Notably, this is terminology that the '074 patent relies upon to support the claim recitation of "switch node," describing, for example, that "the switch fabric at Node B needs to be configured to route the signal received from Node A."

EX1001, 1:14-18, 6:62-66 (describing "Node D" as including "a switch fabric").

Using such OXCs as the RVSP nodes would have allowed the system resulting from the predictable Berger-Lang-Awduche combination to be compatible with networks utilizing OXCs, which at the time were predicted to "play an active role in future optical networks." EX1005, 1; EX1003, ¶81. As Lang teaches, at the time it was believed that "[f]uture optical networks will consist of ***label switched routers (LSRs)*** and ***optical crossconnects (OXCs)*** that internetwork using the MPL(ambda)S control plane." *Id.*, 2.

Indeed, Awduche describes the connection paths established using Path messages as "label-switched paths," indicating that the nodes are "switches." EX1006, 1-2, 3-4 (describing using Label Switched Routers (LSR) as nodes in RSVP); 17-19 (describing an originating RSVP node as "the originating ***switch***"); EX1003, ¶¶81.

Furthermore, a POSITA would have known that RSVP nodes were commonly implemented as switches. EX1003, ¶¶82-83 (citing EX1009, 8-9, 2-3, 15 (demonstrating the knowledge of a POSITA that "***Each node*** consists of an integrated IP router and ***optical layer crossconnect (OLXC)***" and that "[e]ach OXC is assumed to be capable of ***switching a data stream***" using a "***switching function***."); EX1007, 5-6 (describing RSVP nodes as "switches which are capable of doing label lookup and replacement"), 8 (disclosing various RSVP switch

nodes)). For example, one of the benefits of Lang's suggestions is to make RSVP compatible with "optical crossconnects (OXCs)" (EX1005, 1-2) and a POSITA would have known that "OXCs and LSRs are used to switch the LSPs." EX1009, 9, 12 ("OXC switch elements"); EX1003, ¶83. Therefore, Lang's disclosure of using OXCs as RSVP nodes renders obvious the claimed "first switch node" in the resulting combination. EX1003, ¶83.

Element [1.3b]

The Berger-Lang-Awduche combination also provides element [1.3b] (alternative to element [1.3a], *supra*, Section VI). EX1003, ¶¶84-87. That is, the Berger-Lang-Awduche combination provides scenarios in which a Bundle message includes a plurality of connection requests (Path messages) a plurality of failure notifications, or a combination of both (with or without additional message types included in the bundle message). EX1003, ¶84. As discussed in Sections VII.A.2, *supra*, Lang describes "***Failure Notification[s]***…to notify the nodes responsible for restoring the ***failed optical trails***" and further discloses bundling multiple failure notifications "in a single bundle message." EX1005, 6-8, 3 ("we introduce a new ***Notify message*** that is to ***notify nodes when failures occur*** in the network."). Lang uses both the terms "path" and "trail" to refer to an end-to-end connection between two nodes. EX1005, 1-2 ("Support for provisioning and restoration of ***end-to-end optical trails***."); EX1003, ¶¶85, 39-41. Lang further discloses that a

source node is responsible for rerouting multiple trails (i.e., multiple different connections) in response to a detected failure, disclosing that "for end-to-end path restoration, the source is ***responsible for rerouting failed trails***, and must be notified when the trail's resources are involved in a failure." EX1005, 3. Specifically, a source node may be responsible for "rerouting ***multiple optical paths simultaneously***." EX1005, 8. This may require "send[ing] ***multiple [failure] Notify messages***…to a particular source RSVP node if it detects a failure affecting ***multiple trails*** with that node as the source." *Id.* In other words, multiple different failure notifications are transmitted to the same node to alert the source node to failures for multiple different trails/connections. EX1003, ¶87. Lang therefore proposes including multiple failure notifications, each corresponding to a different path/trail/connection in a single bundle message:

> "In order to effectively restore the network to a stable state, nodes that are running restoration algorithms should ***consider as many failed trails as possible*** before making restoration decisions. To improve performance and ensure that the nodes are provided with ***as many of the affected paths as possible***, it is useful to ***include the entire set of Notify messages in a single bundle message and send it to the responsible RSVP node directly***."

EX1005, 8; *see also* EX1006, 4 ("***LSP tunnels*** can be automatically or manually ***routed away from network failures***, congestion, and bottlenecks. Furthermore,

multiple parallel LSP tunnels can be established between two nodes.").

Element [1.4]

Berger describes that "RSVP Bundle messages…[are] ***sent to RSVP neighbors*** that support bundling." EX1004, 7-8 ("Sending RSVP Bundle Messages"). "RSVP Bundle messages are sent hop by hop between RSVP-capable nodes." *Id.*

Lang proposes an improvement in which bundle messages can be transmitted to non-adjacent nodes: "[i]t is useful to include the entire set of [failure] Notify messages in a single bundle message and ***send it to the responsible RSVP node directly***." EX1005, 7-8, 2 ("…allow ***bundle messages*** to be ***sent*** to ***non-adjacent RSVP nodes***."); EX1003, ¶¶88-89. The recipient node in the resulting combination provides the claimed second component of the communication network. EX1003, ¶89.

Element [1.5]

Berger describes that upon "[r]eceiving RSVP Bundle Messages…***[t]he receiver then starts decapsulating individual sub-messages***" such that "each sub-message is processed as if it was received individually." EX1004, 8, 12 ("As is always the case with the Bundle message, ***each sub-message is processed as if it was received individually***."); EX1005, 8 ("The source RSVP node will send an RSVP MESSAGE ACK" for each message "in the bundle message."). A POSITA

would have understood that "decapsulating individual sub-messages" renders obvious "the second component recovers the plurality of messages from the bundled message." EX1003, ¶¶90-91.

Element [1.6a]

The Berger-Lang-Awduche combination provides element [1.3a]. EX1003, ¶¶92-94. As previously discussed, in the resulting combination "each sub-message is processed as if it was received individually." EX1004, 8, 12. Furthermore, as discussed with respect to element [1.3a] *supra*, the sub-messages can include "any message type" including multiple Path messages each corresponding to a different path connection request. EX1004, 6-8; EX1003, ¶¶92, 76.

Awduche provides additional details on how the recipient node processes Path messages to establish connections in the predictable Berger-Lang-Awduche combination. EX1003, ¶¶93-94. As Awduche teaches "***[t]o create an LSP tunnel***, the first MPLS node on the path -- that is, the sender node with respect to the path -- ***creates an RSVP Path message***." EX1006, 7. This Path message "***triggers the receiver to allocate a label***" for the Path. EX1006, 19, 8 ("The LABEL_REQUEST object requests intermediate routers and receiver nodes to provide a label binding for the session."). A POSITA would have recognized that allocation of a label "[t]o establish an LSP tunnel" by the receiving node in response to receiving a Path message renders obvious configuring the first switch

node for a connection. EX1006, 19; EX1003, ¶93. "Furthermore, ***multiple parallel LSP tunnels can be established between two nodes***." EX1006, 4 (further describing the recipient node routing paths "away from network failures, congestion, and bottlenecks."). Awduche's teaching of establishing multiple parallel LSP tunnels (i.e., connections) between two nodes using Path messages paired with Berger's disclosure of Bundling Path messages and processing each message in a Bundle message "as if it was received individually" renders obvious "the second component implements the plurality of connection requests to configure the first switch node for a plurality of connections" as recited by element [1.6a]. EX1004, 6-8, 12; EX1003, ¶¶93-94.

Element [1.6b]

The Berger-Lang-Awduche combination also provides element [1.6b] (alternative to element [1.6a], *supra*, Section VI). EX1003, ¶¶95-96. As discussed with respect to element [1.3b], *supra*, Lang discloses that a source node is responsible for rerouting multiple trails (i.e., multiple different connections) in response to a detected failure, disclosing that "for end-to-end path restoration, the source is ***responsible for rerouting failed trails***, and must be notified when the trail's resources are involved in a failure." EX1005, 3, 6 ("notify the ***nodes*** responsible for ***restoring the failed optical trails***."). Specifically, a source node may be responsible for "***rerouting multiple optical paths simultaneously***."

EX1005, 8. Lang therefore describes bundling multiple failure notification into a single bundle message sent to a node responsible for rerouting the multiple paths to allow the recipient node "running ***restoration algorithms*** [to] consider as many ***failed trails*** as possible before making ***restoration decisions***" to allow the receiving node to consider "***as many of the affected paths*** as possible." EX1005, 7-8. The recipient node is "responsible for restoring the trails when failures occur." EX1005, 6-7. This is initiated by receipt of the failure notifications included in a bundle message at the node responsible for restoring the trails/paths/connections, the bundle message "includ[ing] the entire set of Notify messages in a single bundle." EX1005, 6-8; EX1003, ¶96; *see also* EX1006 2 (describing "tunnels which can be automatically routed away from network failures"), 4 ("rout[ing] away from network failures"), 11 ("LSP tunnel reroute is usually required is upon failure of a resource along the tunnel's established path.").

Element [1.7]

As previously discussed, the first and second components are different nodes in the RSVP network. EX1005, 5-8; EX1006, 7-8, 19; EX1003, ¶¶97-100. Furthermore, each node in the RSVP network is implemented as a switch in the predictable Berger-Lang-Awduche combination. *See* analysis of element [1.3a], *supra*; EX1003, ¶¶99-100, 80-83 (citing EX1005, 1-2; EX1006, 1-2, 3-4, 17-19; EX1009, 2-3, 8-9, 15; EX1007, 5-6).

Claim [2]

The Berger-Lang-Awduche combination also provides claim 2. *See* analysis of elements [1.2], [1.3b], *supra*; EX1003, ¶¶101-102, 74-75, 84-87.

Claim [3]

The Berger-Lang-Awduche combination also provides claim 3. *See* analysis of elements [1.2], [1.3a], *supra*; EX1003, ¶¶103-106, 74-75, 76-79. For example, Awduche describes using Path messages to create paths: "***[t]o create an LSP tunnel***, the first MPLS node on the path -- that is, the sender node with respect to the path -- ***creates an RSVP Path message*** with a session type of LSP_Tunnel_IPv4 and inserts a LABEL_REQUEST object ***into the Path message***." *Id.*, 7, *see also* 20 (describing that a node needs to recognize such a "LABEL_REQUEST" in a path message for successful "path setup.").

Claim [4]

Berger discloses that each "sub-message" included in a Bundle message "MAY be ***any message type***" and expressly discloses that such messages include "Path and PathTear messages." EX1004, 6, 8. These "PathTear messages" are connection tear down requests as they instruct RSVP nodes to "deallocate resources." EX1004, 3; EX1003, ¶¶107-109. Therefore, the predictable Berger-Lang-Awduche combination provides that the bundle message includes connection set-up request and connection tear-down request messages in the same bundle

message. Awduche similarly discloses using a PathTear message to request that an old connection is torn down. EX1006, 38 (After transitioning to a new route, a node "SHOULD send a ***PathTear message for the old route***."), 11-12 ("tearing down the old LSP tunnel"), 46; *see also* EX1005, 1 ("…teardown, and reroute optical trails through the network").

Although Awduche discloses "establishing a new LSP tunnel and transferring traffic from the old LSP tunnel onto it before tearing down the old LSP tunnel" in some scenarios, this disclosure does not negate Berger's disclosure of including combinations of "any message type" in a Bundle message, including "Path and PathTear messages." EX1006, 11; EX1004, 6, 8; EX1003, ¶109. For example, even if an existing path is to be kept intact until the new path is established, a POSITA would have recognized that Path and PathTear messages would have been included in the same Bundle message in scenarios in which the recipient node is being asked to establish a new path and teardown another, unrelated path (e.g., perhaps with a different destination node). EX1003, ¶109. As Berger expressly discloses:

> ***Any message*** that will be handled by the RSVP neighbor indicated in a Bundle Message's destination address may be ***included in the same message***. This includes all RSVP messages that would be sent out a point-to-point link. It includes ***any message***, such as a Resv, ***addressed***

> ***to the same destination address***. It also includes ***Path and PathTear messages when the next hop is known to be the destination*** and changes in next hops can be detected.

EX1004, 8.

Claim [5]

As discussed with respect to element [1.3a], *supra*, in the Berger-Lang-Awduche combination, the second component (the node that receives the bundle message) is part of the first switch node. EX1004, 6-8 ("Any message that will be handled by the RSVP neighbor indicated in a Bundle Message's destination address."); EX1005, 7-8, 1-2 ("we propose a modification to allow ***bundle messages to be sent to non-adjacent RSVP nodes***."); EX1003, ¶¶110-113, 80-83. Furthermore, the first component (the node that sends the bundle message) is part of another switch node in the communication network. For example, Berger describes that "RSVP Bundle messages are sent hop by hop between RSVP-capable nodes." EX1004, 7-8; EX1005, 7-8 ("an intermediate node may need to send multiple Notify messages" in a bundle message); EX1003, ¶¶95, 110, 113, 115. Each node in the RSVP network is implemented as a switch in the predictable Berger-Lang-Awduche combination. *See* analysis of element [1.3a], *supra*; EX1003, ¶¶110-113, 80-83 (citing EX1005, 1-2; EX1006, 1-2, 3-4, 17-19; EX1009, 2-3, 8-9, 15; EX1007, 5-6).

Claim [6]

The Berger-Lang-Awduche combination also provides claim 6. EX1003, ¶¶114-115. For example, Berger discloses that "[a]ny message that will be handled by the RSVP neighbor indicated in a Bundle Message's destination address ***may be included in the same message***. This includes all RSVP messages that would be sent out a point-to-point link. ***It includes any message***, such as a Resv, ***addressed to the same destination address***." EX1004, 8. As discussed with respect to element [1.3a], *supra*, multiple Path messages from a sending node to a recipient node can be included in a Bundle message so that "***multiple parallel LSP tunnels*** can be established ***between two nodes***." EX1006, 4; EX1004, 6-8; EX1003, ¶114. Lang similarly discloses that multiple failure notifications are included in a bundle message when "***an intermediate node*** may need to send multiple Notify messages…to ***a particular source RSVP node*** if it detects a failure ***affecting multiple trails with that node as the source***." EX1005, 8; EX1003, ¶115.

Claim [7]

The Berger-Lang-Awduche combination also provides claim 7. EX1003, ¶¶116-117. Specifically, Awduche discloses that "[a]nother important context when LSP tunnel reroute is usually required is upon failure of a resource along the tunnel's established path. Under some policies, ***it may also be necessary to return the LSP tunnel to its original path when the failed resource becomes re-***

activated." EX1006, 11-12. This restoring process includes "send[ing] a ***new Path Message*** using the original SESSION object and the new SENDER_TEMPLATE and ERO. ***It continues to use the old LSP and refresh the old Path message***. On links that are not held in common, the new Path message is treated as a conventional new LSP tunnel setup." EX1006, 12; *see also* EX1005, 7-8 (describing bundled messages used to "enable fast protection/***restoration*** techniques."). Berger discloses that each "sub-message" included in a Bundle message "MAY be ***any message type***" and expressly discloses that such messages include Path messages. EX1004, 6, 8.

As further described by Awduche, restoring connectivity between two nodes "upon failure of a resource along the tunnel's established path" involves "rerouting" by "establishing a new LSP tunnel and transferring traffic from the old LSP tunnel onto it before tearing down the old LSP tunnel." EX1006, 11. Awduche discloses that "a new ERO to define the new path" is included in "a new Path Message using the original SESSION object" as part of setting up a new path to restore communications between a source and destination. EX1006, 12. "When ***a fault is detected*** on an adjacent downstream link or node, a transit router can ***reroute traffic for fast service restoration***." EX1006, 39. As previously described, routing and rerouting of traffic is performed using Path messages included in Bundle messages in the predictable combination. EX1003, ¶¶117, 61-63, 76-79.

6. Application of the Berger-Lang-Awduche combination to Claims 14-20, 26-29

The limitations of claims 14-20 and 26-29 are provided by the predictable Berger-Lang-Awduche combination for the same reasons discussed with respect to claims 1-7, as illustrated in the below table, and for the additional reasons provided below. The straightforward overlapping subject matter of these corresponding claims is apparent, they are rendered obvious by the same predictable combination for the same reasons discussed above (and the additional below explanations). EX1003, ¶¶118-120.

Claim Element	Cross-Reference to Prior Art Analysis of Corresponding Claim Element(s)
[14.P]	[1.P], [1.4], and [1.5]
[14.1]	[1.1], [1.5], *see also below*
[14.2]	[1.1], [1.4], and [1.5]
[14.3]	[1.1]
[14.4]	[1.2]
[14.5a]	[1.3a]
[14.5b]	[1.3b]
[14.6]	[1.7]
[14.7]	[1.5]
[14.8a]	[1.6a]
[14.8b]	[1.6b]
[15]	[2]
[16]	[3]
[17]	[4]
[18]	[5]
[19]	[6]
[20]	[7]
[26.P]	[1.P]
[26.1]	[1.1]
[26.2]	[1.2]

[26.3a]	[1.3a]
[26.3b]	[1.3b]
[26.4]	[1.4]
[26.5]	[1.5]
[26.6a]	[1.6a]
[26.6b]	[1.6b]
[26.7]	[1.2], [2], [3], [4]
[27.P]	[1.P], [1.4], and [1.5]
[27.1]	[1.1], [1.5], *see also below*
[27.2]	[1.1], [1.4], and [1.5]
[27.3]	[1.1]
[27.4]	[1.2]
[27.5a]	[1.3a]
[27.5b]	[1.3b]
[27.6]	[1.2], [2], [3], [4]
[27.7]	[1.5]
[27.8a]	[1.6a]
[27.8b]	[1.6b]
[28.P]	[1.P]
[28.1]	[1.1]
[28.2]	[1.2]
[28.3a]	[1.3a]
[28.3b]	[1.3b]
[28.4]	[1.4]
[28.5]	[1.5]
[28.6a]	[1.6a]
[28.6b]	[1.6b]
[28.7]	[7]
[29.P]	[1.P], [1.4], and [1.5]
[29.1]	[1.1], [1.5], *see also below*
[29.2]	[1.1], [1.4], and [1.5]
[29.3]	[1.1]
[29.4]	[1.2]
[29.5a]	[1.3a]
[29.5b]	[1.3b]
[29.6]	[7]
[29.7]	[1.5]
[29.8a]	[1.6a]
[29.8b]	[1.6b]

Elements [14.1], [27.1], and [29.1]

Berger describes that "RSVP Bundle messages…[are] ***sent to RSVP neighbors*** that support bundling." EX1004, 7-8. Lang proposes an improvement in which bundle messages can be transmitted to non-adjacent nodes: "[i]t is useful to include the entire set of [failure] Notify messages in a single bundle message and ***send it to the responsible RSVP node directly***." EX1005, 7-8, 1-2. Berger further describes "***[r]eceiving RSVP Bundle Messages***" at the receiver node and describes that "***[t]he receiver then starts decapsulating individual sub-messages***" such that "each sub-message is processed as if it was received individually." EX1004, 8, 12. The receiver node provides the claimed second component. EX1003, ¶119.

As another example, Lang describes that "[t]he source RSVP node will send an RSVP MESSAGE ACK…containing the message IDs of all of the messages in the bundle" in response to receiving a bundle message containing a plurality of failure notification messages. EX1005, 8; EX1003, ¶120.

B. GROUND 2: The Berger-Lang-Awduche-Rosen combination renders obvious claims 1-7, 14-20, 26-29

1. Overview of Rosen

Rosen provides even more details regarding the RSVP protocol described by Berger, Lang, and Awduche. EX1007, 44, 14 (referencing the "MPLS-RSVP"

label distribution protocol); EX1003, ¶¶46-47. Rosen describes various aspects of "the MPLS forwarding paradigm" which stands for "Multiprotocol Label Switching." EX1007, 1, 4-7. Rosen describes switching packets between network nodes by categorizing packets into "Forwarding Equivalence Classes (FECs)" and "map[ping] each FEC to a next hop." *Id.*, 5. MPLS reduces switching overhead by assigning a "label" to each packet identifying its FEC when "the packet enters the network." *Id.* This label based switching not only saves overhead but allows for compatibility with a wide variety of networking equipment, including "***switches*** which are capable of doing label lookup and replacement, but are either not capable of analyzing the network layer headers, or are not capable of analyzing the network layer headers at adequate speed." EX1007, 5-6.

Rosen further specifies that the nodes in the MPLS system (which can be implemented as an MPLS-RSVP system (EX1007, 14)) are switches. EX1007, 20, 29-32. Specifically, Rosen describes that the system can be implemented using "data link switches" or that each node can be "an L2 switch (e.g., an ATM switch)." EX1007, 20, 30-33 (describing using "ATM switching hardware…to provide MPLS switching functions"). As another example, Rosen describes that "the hop between two ***MPLS nodes***" is a "label ***switched*** hop" and describes that a "label ***switching*** router" (LSR) is "an MPLS ***node***." EX1007, 8.

2. The Predictable Berger-Lang-Awduche-Rosen Combination and application to claims 1-7, 14-20, 26-29

As discussed with respect to above, a POSITA would have recognized that the "nodes" of the predictable Berger-Lang-Awduche combination rendered obvious the claimed switches due to, for example, Lang's disclosure of RSVP nodes including "internal switching fabric." EX1005, 1-3; EX1003, ¶¶80-83, 110-113, 121. However, in the event that it is not believed that the Berger-Lang-Awduche combination renders obvious that the nodes are switches, Rosen provides additional details on implementing nodes in a label switched network, such as a networking implementing RSVP, as switches. EX1007, 37, 12 (referencing the "MPLS-RSVP" label distribution protocol); EX1006, 1 ("…use of RSVP…to establish label-switched paths (LSPs) in MPLS); EX1003, ¶¶46-47, 122-130.

Multiple reasons would have prompted a POSITA to configure the system of the Berger-Lang-Awduche combination to implement the nodes as switches, based on Rosen's suggestion. First, a POSITA would have been prompted to modify the Berger-Lang-Awduche combination in such a manner based on Rosen's suggestion because Lang expressly contemplates that "[f]uture optical networks will consist of label switched routers (LSRs) and optical crossconnects (OXCs) that internetwork using the MPL(ambda)S control plane" and Rosen expressly discloses using "ATM Switches as LSRs" to allow for compatibility with "legacy" networks.

EX1005, 2; EX1007, 32; EX1003, ¶¶126-127; *see also* EX1006, 3-4 ("MPLS architecture [2] defines a label distribution protocol as a set of procedures by which one Label Switched Router (LSR) informs another of the meaning of labels used to forward traffic between and through them."). A POSITA would have recognized that using ATM switches as LSRs in the proposed combination would have allowed for implementation of RSVP label switching in existing networks having "legacy 'label swapping' switches such as ATM switches" without having to upgrade switching equipment. EX1007, 32; EX1003, ¶¶126-127. As Rosen teaches, "legacy switches can, with suitable software upgrades, be used as LSRs." *Id.* Therefore, as would have been recognized by a POSITA, network designers could implement RSVP based networks without having to deal with the increased cost of replacing switching hardware. *Id.* Rosen describes several techniques that can be used to utilize legacy ATM switches as LSRs. EX1007, 32-38.

Second, Rosen discloses that MPLS forwarding (such as in an MPLS-RSVP system) can be implemented using any "***switches*** which are capable of doing label lookup and replacement." EX1007, 5-6. Therefore, implementing Rosen's suggestion to implement RSVP nodes as switches would have allowed for a wide range of switching hardware to be utilized as the nodes in the RSVP system of the Berger-Lang-Awduche combination, thereby leading to a higher degree of

compatibility with existing networks, so long as the switches in the existing networks "are capable of doing label lookup and replacement." *Id.*; EX1003, ¶128.

Third, Berger, Lang, and Awduche all contemplate using MPLS and Rosen provides additional details on how to implement MPLS forwarding, including by describing hardware to use as nodes in an RSVP network that uses MPLS forwarding ("switches which are capable of doing label lookup and replacement"). EX1004, 31 (referencing "MPLS"); EX1005, 2 ("This document builds on work already done for traffic engineering in MPLS"); EX1006, 1 ("This document describes the use of RSVP, including all the necessary extensions, to establish label-switched paths (LSPs) in MPLS."), 4-6; EX1007, 5-6; EX1003, ¶129. Indeed, Awduche expressly cites to Rosen (EX1006, 47) and therefore a POSITA would have looked to Rosen to provide additional details on how to successfully implement an RSVP system, including suggestions for what type of hardware to use as the RSVP nodes to provide a functioning RSVP network. EX1003, ¶129.

Fourth, a POSITA would have been prompted to implement Rosen's teaching to use switches as nodes in the system resulting from the combination of Berger with Lang and Awduche because doing so would have been merely the application of a known technique to a known system ready for improvement to yield predictable results. *KSR*, 550 U.S. at 417; EX1003, ¶130. A POSITA would have furthermore had a reasonable expectation of success in modifying the RSVP

system of the Berger-Lang-Awduche combination based on Rosen as they all are directed to related aspects of the same networking technology. EX1003, ¶130. Indeed, Berger's authors specifically "request[] discussion and ***suggestions for improvements***" and Rosen provides just such a suggested improvement. EX1004, 1.

A POSITA therefore would have found it obvious to implement the RSVP nodes as switches in the predictable Berger-Lang-Awduche-Rosen combination, rendering obvious the claimed switches recited by the claims of the '074 patent. EX1003, ¶¶122-130. All other elements of the challenged claims are achieved by the prior art combination for the identical reasons discussed with respect to Ground 1, *supra*.

C. GROUND 3: The Berger-Lang-Awduche-Baker combination renders obvious claim 13

1. Overview of Baker

As with Berger, Lang, and Awduche, Baker is directed toward improvements to the RSVP communications networking protocol. EX1008, 1. Specifically, Baker describes aggregation of RSVP messages and specific details regarding aggregation of messages in RSVP. *Id.* Baker describes that sending reservation messages to reserve network resources (e.g., for use in a communications path) "requires a non-trivial amount of message exchange, computation, and memory resources in each router along the way." EX1008, 2;

EX1003, ¶¶48-50. One solution to this overhead problem described by Baker is message aggregation. EX1008, 2; EX1003, ¶¶48-50. Baker further provides additional suggestions to overcome the "challenges" raised through use of Aggregation, including the "negative effect" of the reduction of isolation between individual flows. *Id.*

Baker describes that, similar to the Bundle messages described by Berger and Lang, Aggregated messages can include "Aggregate Path messages." EX1008, 8. Yet another improvement to message aggregation described by Baker is "Multi-level Aggregation." EX1008, 12. Baker describes "an aggregation scheme" that is "able to accommodate recursive aggregation, with ***aggregate reservations being themselves aggregated***. Multi-level aggregation can be accomplished using the procedures described herein and a simple extension to the protocol number swapping process." *Id.* Baker describes that a lone reservation message is considered "to be at aggregation level 0" while aggregating a group of reservation messages "produce[s] reservations at aggregation level 1. In general, level n reservations may be aggregated to form reservations at level n+1." *Id.* The aggregation level can be written in a field of the aggregated message. *Id.* The multi-level aggregated messages can later be de-aggregated any number of levels. *Id.*

2. The Berger-Lang-Awduche-Baker Combination

A POSITA would have been motivated to apply Baker's teachings regarding multi-level aggregation to the bundle messages of the Berger-Lang-Awduche combination described in Ground 1, *supra*, to advantageously employ multi-level bundle messages. EX1003, ¶¶131-142, 48-50; EX1008, 12. Indeed, as described by Berger, "[a] Bundle message is used to ***aggregate*** multiple RSVP messages" and therefore a POSITA would have recognized that the multi-level aggregation technique disclosed by Baker would have been equally applicable to the bundle messages disclosed by Berger and Lang to create multi-level Bundle messages that aggregate messages included in multiple other Bundle messages. EX1004, 5; EX1008, 12; EX1003, ¶137. Although Berger specifies that Bundle messages are distinct from RSVP reservation aggregation messages, a POSITA would have recognized that Baker's teaching regarding multi-level aggregation would have applied equally to RSVP Bundle messages. EX1004, 5; EX1003, ¶138. Furthermore, although the current implementation described by Berger allows for a Bundle message to include "any message type except for another Bundle message," a POSITA would have recognized this disclosure does not teach against multi-level aggregation of Bundle messages but merely describes the currently implemented configuration for RSVP Bundle messages. EX1004, 6; EX1003, ¶138. Just as Lang teaches an improvement to RSVP Bundle messages to allow them to be sent to non-adjacent nodes, Baker teaches another improvement to

Bundle messages by suggesting multi-level aggregation of Bundle messages. EX1003, ¶138. Alternatively, a POSITA would have recognized that the benefits of multi-level aggregation would have been achieved by bundling the sub-messages contained within multiple Bundle messages into a single Bundle message without including the original Bundle messages as sub-messages within the aggregate Bundle message. *Id.*

Multiple reasons would have prompted a POSITA to apply Baker's suggestion for multi-level aggregation to the Bundle messages of the Berger-Lang-Awduche combination. First, applying "recursive aggregation" (as taught by Baker) to Bundle messages would have increased the overhead reduction benefits of Bundle messages. EX1008, 12; EX1003, ¶139. As Berger describes "Bundle message[s]" function to "***reduce overall message handling load***." EX1004, 3; *see also* EX1005, 7 ("use of bundle messages to reduce the overall message-handling load."). Aggregating sub-messages from two or more Bundle messages received at a node, where the sub-messages are intended for the same recipient node, into a single Bundle message rather than simply forwarding each of the multiple Bundle messages would have further advanced this reduction in overall message handling load for the system. EX1003, ¶139.

Second, as described by Berger, and as would have been known to a POSITA, "message bundling helps in scaling RSVP, by ***reducing processing***

overhead and bandwidth consumption." EX1004, 7; EX1003, ¶140. Aggregating sub-messages intended for the same recipient node from two or more Bundle messages received at a transient node into a single Bundle message, rather than simply forwarding each of the multiple Bundle messages, would have further increased both of these benefits of message bundling. EX1003, ¶140. A POSITA would have recognized that any reduction in the number of messages due to bundling of as many sub-messages as possible into a single bundle message (including sub-messages received from multiple different other bundle messages) would have further reduced processing overhead and bandwidth consumption by decreasing the total number of messages being exchanged in the network. EX1003, ¶140.

Third, Berger teaches that "[a]ny message that will be handled by the RSVP neighbor indicated in a Bundle Message's destination address may be included in the same message." EX1004, 8. A POSITA would have recognized that applying Baker's multi-level aggregation suggestion to the Bundle messages of the Berger-Lang-Awduche combination would have been an obvious extension of this teaching by allowing all sub-messages received at a node in separate bundle messages to be bundled together in a single Bundle message when all of the sub-messages from the multiple received Bundle messages have the same destination address. EX1003, ¶141. Indeed, Berger teaches that this "includes any message,

such as a Resv, addressed to the same destination address." EX1004, 8. As discussed above, Reservation messages are the express message type described by Baker as benefiting from multi-level aggregation. EX1008, 12. Therefore, a POSITA would have recognized that the benefits of multi-level aggregation described by Baker were equally applicable to Bundle messages. EX1003, ¶141.

Fourth, a POSITA would have been prompted to apply Baker's suggestion for multi-level aggregation to the bundle messages of the system resulting from the combination of Berger with Lang and Awduche because doing so would have been merely the application of a known technique to a known system ready for improvement to yield predictable results. EX1003, ¶142; *KSR*, 550 U.S. at 417. A POSITA would have furthermore had a reasonable expectation of success in modifying the RSVP system of the Berger-Lang-Awduche combination based on Baker as they all are directed to related aspects of the same networking technology. EX1003, ¶¶142. Indeed, Berger's authors specifically "request[] discussion and ***suggestions for improvements***" and Baker provides just such a suggested improvement. EX1004, 1.

3. Application of the Berger-Lang-Awduche-Baker combination to Claim 13

Claim [13]

As described by Berger, nodes in an RSVP system can "***[r]eceiv[e] RSVP Bundle Messages***" and "***[t]he receiver then starts decapsulating individual sub-***

messages" such that "each sub-message is processed as if it was received individually." EX1004, 8, 12. As described by Awduche, such "processing" of a sub-message received in a Bundle message includes forwarding of a message intended for a different ultimate destination. EX1006, 3-4, 8 ("When the EXPLICIT_ROUTE object (ERO) is present, ***the Path message is forwarded*** towards its destination along a path specified by the ERO."), 15 ("forward Resv messages"), 34. A POSITA applying Baker's suggestion to the resulting combination of Berger-Lang-Awduche would have recognized that sub-messages received in separate Bundle messages at an intermediate node (such as the sending node discussed with respect to claim 1, *supra*) that are all intended for the same destination node (such as multiple Path messages that need to be forwarded to the same destination node) would have been beneficially bundled into a single Bundle message bound for the destination node to achieve the overhead reduction benefits and other benefits described in Section VII.C.2, *supra*. EX1003, ¶¶131-138; EX1008, 12.

Alternatively, in a scenario in which an intermediate node receives multiple Bundle messages that are each intended for the same destination node, a POSITA would have been prompted to apply Baker's teaching regarding multi-level aggregation to the received Bundle messages to Bundle the messages together into a single Bundle message (or alternatively, Bundle the individual sub-messages in

the Bundle messages into a single Bundle message) to generate a single Bundle message to be forwarded to the destination node to achieve the benefits described in Section VII.C.2, *supra*. EX1003, ¶135.

In yet another alternative scenario, a POSITA would have recognized, based on the teachings of Baker regarding multi-level aggregation and the teachings of Berger regarding the benefits of message bundling, that in a scenario in which an intermediate node (such as the sending node discussed with respect to claim 1, *supra*) receives a Bundle message and another non-bundled message from two different nodes and both the Bundle message and the non-bundled message are intended for the same destination node, that Baker's teachings regarding multi-level aggregation would have beneficially applied to generate a new bundle message that includes at least some of the sub-messages of the Bundle message and the non-bundled message so that only a single message needs to be forward, thereby achieving the above described benefits. EX1003, ¶136.

D. GROUND 4: The Berger-Lang-Awduche-Rosen-Baker combination renders obvious claim 13

A POSITA would have been prompted to apply Baker to the Berger-Lang-Awduche-Rosen combination discussed with respect to Ground 2 for the same reasons discussed in Section VII.C.2, *supra*. In particular, the predictable combination of applying Baker's suggestion for multi-level aggregation to the bundle messages to the Berger-Lang-Awduche-Rosen combination (from Ground

2) would have achieved at least the same known benefits specifically articulated above. *Supra*, Section VII.C.2 (citing to EX1003, ¶¶131-142). Additionally, a POSITA would have had a reasonable expectation of success in modifying the RSVP system of the Berger-Lang-Awduche-Rosen combination based on Baker as they all are directed to related aspects of the same networking technology. *Id.* Indeed, Berger's authors specifically "request[] discussion and ***suggestions for improvements***" and Baker provides just such a suggested improvement. EX1004, 1.

The Berger-Lang-Awduche-Rosen-Baker therefore provides claim 13 for the reasons discussed in Sections VII.C.2-3, *supra*.

VIII. INSTITUTION SHOULD NOT BE DISCRETIONARILY DENIED

In *Apple Inc. v. Fintiv, Inc.*, the Board enumerated six factors that provide a "holistic view" as to "whether efficiency, fairness, and the merits support the exercise of authority to deny institution in view of an earlier trial date in [a] parallel proceeding." IPR2020-00019, Paper 11 at 2-3 (PTAB "precedential" Mar. 20, 2020) ("*Fintiv I*"). Guided by precedent, Huawei took affirmative steps to promote the Board's efficiency and fairness goals. Huawei initiated this proceeding with exceptional diligence, filing a single petition narrowly focused on specific claims within a mere nine weeks of learning of WSOU's asserted claims, and provided a stipulation akin to *Sand Revolution* to eliminate overlapping prior

art grounds between the instituted IPR proceeding and the Related Litigation. EX1102. Moreover, the actual trial date scheduled for the '074 patent is subject to speculation (because the '074 patent will be grouped into a jury trial for the "first of the consolidated cases" starting on September 26, 2022 or a later trial for the "remaining consolidated cases" on a subsequent (unknown) date). EX1101, 5. These facts, paired with the strong merits of Grounds 1–4, provide compelling reasons to institute. *Sand Revolution II, LLC v. Continental Intermodal Group*, IPR2019-01393, Paper 24, 12 (PTAB "Informative" June 16, 2020).

Relevant Facts—Between September 29, 2020 and October 2, 2020, WSOU filed six separate infringement actions against Huawei involving six unrelated patents asserted against several unrelated products. *See* EX1100. These six lawsuits are concurrently pending in the Western District of Texas ("the Court") before the Honorable Judge Alan D. Albright. *Id*. The action involving the '074 patent was assigned Case No. 6:20-cv-00916 ("the Related Litigation"). The remaining six lawsuits are identified by different cases numbers and are not formally consolidated.

WSOU served its preliminary infringement contentions on February 5, 2021, but oddly characterized the contentions as "confidential" and did not authorize Huawei's in-house counsel to view the charts of the preliminary infringement contentions until February 24, 2021. *See* EX1101, 1. As such, this Petition was

filed nine weeks later after initially learning of the asserted claims and about five weeks after actually viewing infringement charts. This Petition was served on Patent Owner even before Huawei's preliminary invalidity contentions, which are not due until April 12, 2021 (extended from April 7 upon agreement from the parties). *Id*.

The Court set a *Markman* hearing for August 12, 2021, and the parties are scheduled to exchange terms for construction on April 16, 2021. *See* EX1101, 2-3. Per the Court's default order, fact discovery will formally open on August 16, 2021, two business days after the *Markman* hearing. *See* EX1101, 3. In other words, little discovery—and certainly no meaningful expert discovery regarding invalidity of the '074 patent under 35 U.S.C. §§ 102 and 103—will be completed at the time of the Board's institution decision here.

For purposes of planning earlier dates throughout discovery, etc., the Court set two placeholder trial dates—a first trial starting on September 26, 2022 for an unknown "first" subset of the six asserted patents and a second, subsequent trial for the "remaining consolidated cases" starting on a date that "will be determined." EX1101, 5. In other words, a jury trial is scheduled for September 26, 2022, but neither the Court nor any party knows which subset of the six asserted patents will be in "the first of the consolidated cases" for the trial on that date. *Id.* More specifically to the '074 patent at issue here, no party currently knows whether the

'074 patent will be part of the "remaining consolidated cases" for second trial starting on a later (unknown) date after the Board's final written decision here. *Id.* Any allegation to the contrary is pure speculation.

Factor 1 (Stay)—No party in the Related Litigation has request a stay at this time. Huawei currently plans to seek a motion to stay after the Board's decision to institute IPR here because, in Judge Albright's court, a motion filed earlier would be premature. Again, the facts at play here are unique. There are six distinct lawsuits (asserting six unrelated patents) all unrealistically scheduled for trial on the same date. In such unique circumstances, it is unclear how Judge Albright would rule on a motion to stay for the particular lawsuit involving the '074 patent, especially after IPR is instituted against the '074 patent months before the due date for Patent Owner to amend its complaint (December 2021) and long before expert reports/discovery (March 2022). This cloud of uncertainty means Factor 1 is neutral.

Factor 2 (Trial Date)—While the Court set September 26, 2022 as a placeholder trial date for an unknown "first" subset of the six asserted patents and a later (unknown) trial for the "remaining consolidated cases," it is far from certain whether the '074 patent will be part of the "first" trial or the later second trial. EX1101, 5. The only certainty at this time is that several of the six patents will not be part of the September 26, 2022 trial because they will be grouped into the

"remaining consolidated cases." *Id.* Presently, there is no hint as to how the scheduling shuffle will play out, and it would be erroneous for any party to speculate that the '074 patent will necessarily be excluded from the "remaining consolidated cases." *Id.*

The *Fintiv* panel noted that the Board "generally take[s] courts' trial schedules at face value absent some strong evidence to the contrary." *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 15, 13 (PTAB, "informative," May 13, 2020) ("*Fintiv II*"). For the reasons detailed above, such "strong evidence" exists on this record. Due to WSOU's litigation tactics, neither the Court nor any party knows which one of the six asserted patents will be the subject of the trial starting on September 26, 2022. There is, in effect, no *certain* date for a jury trial that specifically addresses the '074 patent.

The "informative" guidance in *Sand Revolution* aligns with the facts of this case. *Sand Revolution*, IPR2019-01393, Paper 24 at 8-10. Even if Patent Owner (improperly) speculates the district court will necessarily insert the '074 patent into the "first" subset for a jury trial on September 26, 2022, the narrow gap in time between the jury's final verdict (end of September 2022 or later) and the Board's projected Final Written Decision (October 2022) is less than one month. The panel in *Sand Revolution*, also facing meaningful questions of uncertainty about the trial date, weighed Factor 2 "marginally" *against* denial with a three-month time gap.

Id. The *Sand Revolution* guidance demonstrates the proper result when the district court's "evolving schedule" makes it "unclear" when the trial would be held. *Id.* A similar lack of clarity exists in this case but for a slightly different reason—there is significant uncertainty as to whether the '074 patent will be in the "first" subset for trial on September 26, 2022 or in the second subset of the "remaining consolidated cases" for trial at a later unknown date. EX1101, 5.

Similarly, the Board's analysis in *Google LLC, et al. v. Parus Holdings, Inc.* is compelling. *See* IPR2020-00846, Paper 9, 12-14 (PTAB Oct. 21, 2020). There, the district court reserved a broad range of "predicted" trial dates but declined to specify further. *Id*. (noting a trial date range of July 12-30, 2021, and further noting the court's statement that it was "not going to pick a date right now"). With "only three months" between the range of trial dates and a final written decision, the Board deemed Factor 2 "neutral" based on "substantial uncertainty in the Texas court's 'Predicted Jury Selection/Trial' date." *Id*.

The less-than-a-month time gap presently at issue is narrower than *Sand Revolution* and the trial date uncertainty is comparable to *Google v. Parus*. The well-reasoned analysis in *Sand Revolution* weighed Factor 2 against discretionary denial. A similar outcome is appropriate here.

Factor 3 (Investment)—The Related Litigation is currently in its infancy. Huawei has yet to serve its preliminary invalidity contentions, and the parties have

yet to exchange proposed terms for construction. Huawei acted promptly in response to WSOU's identification of asserted claims in preliminary infringement contentions, filing this Petition only nine weeks after initially learning of the asserted claims and about six weeks after Huawei's in-house counsel was finally authorized to view the charts of the preliminary infringement contentions. *See* EX1101, 1.

At the projected date of institution (October 2021), the fact discovery period will have five more months of duration before the close of fact discovery (March 24, 2022), and expert reports/discovery will not even start until later (closing in May 19, 2022). EX1101, 4. Beyond a *Markman* order, which is not dispositive here and is unrelated to the invalidity issues based upon the prior art publications cited in this Petition, the Court will have not issued any substantive orders relevant to invalidity based on prior art publications.

The facts here compare favorably to *Fintiv*. In that case, also co-pending with litigation at the Western District of Texas, the petitioner filed *five months* after receiving preliminary infringement contentions, but the petition here was filed nine weeks after receiving the asserted claim numbers (and about six weeks after Patent Owner authorized Huawei's in-house counsel to view the claim charts). *See Fintiv II* at 9. There, "[a]t the time of filing the Petition, the parties were in the midst of preparations for the *Markman* hearing," while here, the parties have not

even exchanged terms. *Id*.

The "informative" guidance in *Sand Revolution* is telling here too. By the time of institution in this proceeding, the Related Litigation will be at a similar posture where "aside from the district court's *Markman* Order, much of the district court's investment relates to ancillary matters untethered to the validity issue itself." *Sand Revolution*, IPR2019-01393, Paper 24, 10-11. The parallels are also notable because:

> [M]uch work remains in the district court case as it relates to invalidity: fact discovery is still ongoing, expert reports are not yet due, and substantive motion practice is yet to come.

Id. at 11 (internal citation omitted); *see also Fintiv I* at 10 ("If, at the time of the institution decision, the district court has not issued orders related to the patent at issue in the petition, this fact weighs against exercising discretion to deny institution"). In fact, the circumstances under Factor 3 here are similar to *Sotera*. *See Sotera Wireless, Inc. v. Masimo Corporation*, IPR2020-01019, Paper 12, 16-17 (PTAB Precedential Dec. 1, 2020) ("much other work remains in the parallel proceeding as it relates to invalidity" and the "explanation for timing of the Petition is reasonable, … particular in view of the large number of patents and claims"). In this case too, Factor 3 "weighs in favor of not exercising discretion to deny" as a result of "the relatively limited investment in the parallel proceeding to date" and "the fact that the timing of the Petitioner was reasonable." *Id.* at 17.

Factor 4 (Overlap)—As an initial matter, no party currently knows whether the '074 patent will be part of the "remaining consolidated cases" for the second trial starting on a later (unknown) date after the Board's final written decision here. EX1101, 5; *supra*, Analysis of Factors 1-2. In such circumstances, there would be absolutely no overlap between invalidity grounds addressed in the Board's final written decision and in the later jury trial because 35 U.S.C. §315(e)(2) necessarily forbids it. Given the undefined nature of which one of the jury trials will actually include the '074 patent, these questions related to "overlap" in Factor 4 are, at best, speculative.

Moreover, even if Patent Owner indulges in speculation to assume that the '074 patent will necessarily be part of the "first" subset of cases for trial on September 26, 2022 rather than in the later subset, Huawei's stipulation here "mitigates" concerns related to overlapping prior art grounds. *Sand Revolution*, IPR2019-01393, Paper 24, 11-12; *see* EX1102 ("not pursue…the same prior art grounds"). Additionally, here Huawei challenges additional claims not asserted in the district court litigation (claims 7, 20, and 28-29). This IPR petition represents Huawei's only opportunity to challenge the validity of those claims and therefore demonstrates even more distinctions between this IPR petition and the district court proceeding. According to the informative guidance of *Sand Revolution*, Factor 4 weighs at least "marginally in favor not exercising discretion to deny

IPR." IPR2019-01393, Paper 24, 12.

Factor 5 (Parties)—Because the parties here and at the District Court are the same, Factor 5 favors denial if trial precedes the Board's Final Written Decision and favors institution if the opposite is true (due to the 35 U.S.C. 315(e)(2) estoppel provision). *Google*, IPR2020-00846, Paper 9, 20-21 ("[W]e decline to speculate as to whether we are likely to address the challenged patent before the Texas court. Thus, [Factor 5] is neutral."). Neither circumstance can be confirmed in this case without improper speculation because the *actual* date of a jury trial involving the '074 patent is uncertain. EX1101, 5 (a later unknown trial for "the remaining consolidated cases"). Under these unique circumstances, Factor 5 is neutral.

Factor 6 (Merits and Other Circumstances)—The merits of this Petition are particularly strong. Section VI. above presents four prior art grounds (Grounds 4) against the '074 patent's claims. As discussed, the prior art and arguments at issue here are materially different from those considered by the Examiner during prosecution. The strength of the merits alone is enough to outweigh any inefficiencies born of parallel litigation. *See Fintiv*, 15.

And there are additional circumstances that also favor institution, such as the effect on "the economy [and] the integrity of the patent system." *Consolidated Trial Practice Guide* ("*CTPG*"), 56 (quoting 35 U.S.C. § 316(b)). Relevant to the

former, WSOU, an entity specializing in patent licensing and negotiation, is asserting the '074 patent's overbroad claims against Huawei's communication diversion service. *See* EX1009. Fully vetting a nineteen-year-old patent (filed 2002) only now asserted against Huawei's product would be beneficial to the economy.

The integrity of the patent system equally weighs in favor of institution. The analysis in Section VII of this Petition shows that the '074 patent's Challenged Claims are too broad, and the dubious prosecution record does not adequately explain why the Examiner issued a Notice of Allowance in the first place (*see supra* Section IV.B). AIA trials were intended to "improve patent quality and limit unnecessary and counterproductive litigation costs." *CTPG*, 56 (quoting H.R. Rep. No. 112-98, pt. 1, at 40 (2011)). This case provides an opportunity to fulfill those objectives. The quality of the '074 patent would undoubtedly be improved by cancelling the unpatentable claims presently under challenge. And such a result could avert future litigation (and licensing) costs caused by WSOU's continued assertion efforts.

For all these reasons, Factor 6 and the *Fintiv* Factors as a whole strongly favor institution. Finally, Petitioner notes the ongoing legal challenge to discretionary denials of IPR based on the *Fintiv* and *NHK* precedential decisions (*e.g.*, *Apple Inc. et al. v. Iancu*, No. 5:20-cv-06128 (N.D. Cal.)), and reserves the

opportunity to address the result of that case and any impact in this proceeding.

IX. CONCLUSION

The challenged claims are unpatentable based on the above grounds.

Respectfully submitted,

Dated: April 9, 2021

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(Trial No. IPR2021-00692)

CERTIFICATION UNDER 37 CFR § 42.24

Under the provisions of 37 CFR § 42.24(d), the undersigned hereby certifies that the word count for the foregoing Petition for *Inter Partes* Review totals 12,628 words, which is less than the 14,000 allowed under 37 CFR § 42.24.

Dated: April 9, 2021

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CERTIFICATE OF SERVICE

Pursuant to 37 CFR §§ 42.6(e)(4)(i) *et seq.* and 42.105(b), the undersigned certifies that on April 9, 2021, a complete and entire copy of this Petition for *Inter Partes* Review and all supporting exhibits were provided via Federal Express, to the Patent Owner by serving the correspondence address of record as follows:

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